Patent Claims

1. A multiple-picture output method, featuring:
In an n-point communication environment, a multiple-picture supporting module is configured to extract image data of n points from the MCU and transmit them to a multiple-picture server.
The multiple-picture server converts the received image data into analog video signals and outputs the signals.

2. The method as mentioned in Claim 1 features that the n-point communication environment, a multiple-picture supporting module is configured, meaning that the mentioned multiple-picture supporting module can be inside the MCU or run as independent equipment.

3. In accordance with Claim 2, this method features that the mentioned multiple-picture supporting module can be inside the MCU, and means that:

It can set up a channel for controlling signals and instructions between the mentioned multiple-picture supporting module and multiple-picture server. The channel utilizes process communication technology;

It can set up a channel for controlling signals and instructions between the mentioned multiple-picture supporting module and the MC module of the mentioned MCU. The channel utilizes process communication technology;

It can set up at least one control channel between the MC module and the MP module of the mentioned MCU. The control channel utilizes process communication technology; the MC module controls the MP module through the control channel and transmits the mentioned image data to the multiple-picture server.

4. In accordance with Claim 3, this method features that the mentioned channel utilizes process communication technology, and means that:

The channel may communicate with TCP/IP, or with RPC, or with a message channel.

5. In accordance with Claim 3, this method features setting up a channel for controlling signals and instructions between the mentioned multiple-picture supporting module and the multiple-picture server, and means that:

The channel may communicate with TCP/IP, or with RPC, or with a message channel.

The signals and instruction include: checking the capability of the mentioned multiple-picture server, checking the working conditions of the mentioned multiple-picture server, controlling the mentioned multiple-picture server, reporting the working conditions of the mentioned multiple-picture server, and so on.

6. In accordance with Claim 3, this method features setting up a channel for controlling signals and instructions between the mentioned multiple-picture supporting module and the MC module of the mentioned MCU. The channel utilizes process communication technology, means that:

The channel may communicate with TCP/IP, or with RPC, or with a message channel.

The signals and instruction include: the mentioned MC module checking the capability, the working conditions and the media channels of the mentioned multiple-picture server, and the mentioned multiple-picture supporting module checking the capability, the working conditions and the media channels of the mentioned multiple-picture server, and so on.

7. In accordance with Claim 3, this method features setting up at least one channel for controlling signals and instructions between the MC module and the MP module of the mentioned MCU, and means that:

The channel may communicate with TCP/IP, or with RPC, or with a message channel.

8. The method as mentioned in Claim 3 features being applied according to the following steps:

Setting up a channel between the mentioned multiple-picture supporting module and the multiple-picture server to communicate signals and instructions. The channel can communicate with TCP/IP and package the mentioned signals and instructions according to the TPKT Standard. The mentioned signals and instructions include: checking the capability of the mentioned multiple-picture server, checking the working conditions of the mentioned multiple-picture server, controlling the mentioned multiple-picture server, reporting the working conditions of the mentioned multiple-picture server, and so on;

Setting up a channel between the mentioned multiple-picture supporting module and the MC module of the mentioned MCU to communicate signals and instructions. The signals and instruction include: the mentioned MC module checking the capability, the working conditions and the media channels of the mentioned multiple-picture server, and the mentioned multiple-picture supporting module checking the capability, the working conditions and the media channels of the mentioned multiple-picture server, and so on;

The mentioned multiple-picture server reports information about its system capability and media channels through the mentioned channel between itself and the mentioned multiple-picture supporting module after powering and self-examination;

The mentioned multiple-picture supporting module reports to the MC module information about the system capability and media channels of the mentioned multiple-picture server in order, through the mentioned channel between itself and the mentioned MC module;

The mentioned MC module controls the mentioned MP module to transmit the image date of one communication point from the n points to one media channel of the mentioned multiple-picture server;

The mentioned MC module controls the mentioned multiple-picture supporting module to control the mentioned multiple-picture server.

9. In accordance with Claim 2, this method features that the mentioned multiple-picture supporting module can run as independent equipment, and means that:

The mentioned multiple-picture supporting module obtains the data received and sent by the mentioned MCU;

The mentioned multiple-picture supporting module communicates with the mentioned multiple-picture server;

The mentioned multiple-picture supporting module has a control module, data obtaining module, and data transmitting module. The control module controls the mentioned data obtaining module and data transmitting module to cooperate so as to transmit received data to the mentioned multiple-picture server.

10. In accordance with Claim 9, this method features that the mentioned multiple-picture supporting module obtains the data received and sent by the mentioned MCU, meaning that the mentioned multiple-picture supporting module connects to the mentioned MCU and obtains the data received and sent by the mentioned MCU through the Internet adapter.

11. The method as mentioned in Claim 9 features that the mentioned control module is controlled by the top user interface.

12. The method as mentioned in Claim 9 features that the mentioned data obtaining module provides bottom network programming function through operating systems to obtain data from the Internet in real time and transmits the data received to the mentioned data transmitting module.

13. The method as mentioned in Claim 9 features that the mentioned data transmitting module extracts all or parts of the video data received and sent by the MCU and transmits to the mentioned multiple-picture server.

14. The method as mentioned in Claim 10 features that the mentioned connection between the multiple-picture supporting module and the mentioned MCU refers to the Internet connection.

The Internet connection can be set up through a shared Ethernet concentrator. The mentioned MCU and multiple-picture supporting module both connect to the concentrator.

Or the Internet connection can be set up by using an Ethernet switchboard with port emulating function. The mentioned MCU and multiple-picture supporting module both connect to the switchboard which is configured for emulation of all the data received and sent by the MCU port to the mentioned multiple-picture supporting module port.

Or the mentioned multiple-picture supporting module transmits all the communication data of the mentioned MCU by proxy.

15. The method as mentioned in Claim 9 features being applied according to the following steps:

The mentioned multiple-picture supporting module connects to the mentioned MCU and obtains data received and sent by the mentioned MCU through the Internet adapter. The connection is an Internet connection. The Internet connection can be set up through a shared Ethernet concentrator. The mentioned MCU and multiple-picture supporting module both connect to the concentrator. Or the Internet connection can be set up by using an Ethernet switchboard with port emulating function. The mentioned MCU and multiple-picture supporting module both connect to the switchboard which is configured to emulation of all the data received and sent by the MCU port to the mentioned multiple-picture supporting module port; or the mentioned multiple-picture supporting module transmits all the communication data of the mentioned MCU by proxy.

The mentioned control module is controlled by the top user interface.

The mentioned data obtaining module provides bottom network programming function through operating systems to obtain data from the Internet in real time and transmits the data received to the mentioned data transmitting module.

The mentioned data transmitting module extracts all or parts of the video data received and sent by the MCU and transmits it to the mentioned multiple-picture server.

16. The method as mentioned in Claim 1 features the multiple-picture server converting the received image data into analog video signals and outputs the signals, meaning:

The mentioned multiple-picture server receives image data transmitted by the multiple-picture supporting module under the control of the multiple-picture supporting module. The multiple-picture server then decodes the image data received, turns it into a digital image, converts the digital image into analog video signals through the D/A exchanging module and outputs the signals.

17. The method as mentioned in Claim 16 is applied according to the following steps:

The mentioned multiple-picture server receives the image data transmitted by the mentioned multiple-picture supporting module, and sends the data to the decoder for decoding;

The mentioned decoder receives video data, decodes and decompresses the compressed video data into image data (in YUV format or other), and then converts the digitalized image data into analog video signals by the D/A exchanging module and outputs the signals.

18. The method as mentioned in Claim 17 features the mentioned multiple-picture server being initialized and can start, stop, pause or create image updating applications and so on.

19. The specific application steps for the method as mentioned in Claim 8 or 15 are:

The mentioned multiple-picture server receives the image data transmitted by the mentioned multiple-picture supporting module, and sends the data to the decoder for decoding;

The mentioned decoder receives video data, decodes and decompresses the compressed video data into image data, and then converts the digitalized image data into analog video signals by the D/A exchanging module and outputs the signals.

20. This method meeting any claim of Claim 1 to Claim 18, features the mentioned $n \geq 1$.

21. This method meeting Claim 19, features the mentioned $n \geq 3$.

22. A multiple-picture output system includes the MCU; other features include: multiple-picture supporting module and multiple-picture server.

The multiple-picture supporting module is configured to extract image data of n points from the MCU and transmit them to the multiple-picture server.

The multiple-picture server converts the received image data into analog video signals and outputs the signals.

23. The system as mentioned in Claim 22 features the mentioned multiple-picture supporting module that can be inside the mentioned MCU, and:

Sets up a channel for controlling signals and instructions between the mentioned multiple-picture supporting module and the MC module of the mentioned MCU. The channel utilizes process communication technology;

Sets up a channel for controlling signals and instructions between the mentioned multiple-picture supporting module and the multiple-picture server. The channel utilizes process communication technology;

Sets up at least one control channel between the MC module and the MP module of the mentioned MCU. The control channel utilizes process communication technology; the MC module controls the MP module through the control channel and transmits the mentioned image data to the multiple-picture server.

24. In accordance with Claim 23, this system features setting up a channel for controlling signals and instructions between the mentioned multiple-picture supporting module and multiple-picture server, means that:

The channel may communicate with TCP/IP, or with RPC, or with a message channel;

The channel packages the mentioned signals and instructions according to the TPKT Standards and communicates signals and instructions between the mentioned multiple-picture supporting module and multiple-picture server.

25. The system as mentioned in Claim 24 features that the mentioned signals and instructions include: checking the capability of the mentioned multiple-picture server, checking the working conditions of the mentioned multiple-picture server, controlling the mentioned multiple-picture server, reporting the working conditions of the mentioned multiple-picture server, and so on.

26. In accordance with Claim 23, this system features setting up a channel for controlling signals and instructions between the mentioned multiple-picture supporting module and the MC module of the mentioned MCU means that:

The channel may communicate with TCP/IP, or with RPC, or with a message channel;

The mentioned signals and instruction include: the mentioned MC module checking the capability, the working conditions and the media channels of the mentioned multiple-picture server, and the mentioned multiple-picture supporting module checking the capability, the working conditions and the media channels of the mentioned multiple-picture server, and so on.

27. The system as mentioned in Claim 22 features that the mentioned multiple-picture supporting module can be independent equipment, including control module, data obtaining module, data transmitting module, and the Internet adapter;

The mentioned Internet adapter receives data from the mentioned MCU through the Internet

connection;

The control module communicates with the multiple-picture server;

The control module controls the mentioned data obtaining module and data transmitting module to cooperate and is controlled by the top user interface. The mentioned data obtaining module provides bottom network programming function through operating systems to obtain data from the Internet in real time and transmits the data received to the mentioned data transmitting module;

The mentioned data transmitting module extracts all or parts of the video data which are received by the MCU and transmitted by the mentioned data obtaining module, and transmits to the mentioned multiple-picture server according to controlling instructions.

28. The system as mentioned in Claim 27 features:

The mentioned Internet connection can be set up through a shared Ethernet concentrator. The mentioned MCU and multiple-picture supporting module both connect to the concentrator.

Or the Internet connection can be set up by using an Ethernet switchboard with port emulating function. The mentioned MCU and multiple-picture supporting module both connect to the switchboard which is configured for emulation of all the data received and sent by the MCU port to the mentioned multiple-picture supporting module port.

Or the mentioned multiple-picture supporting module transmits all the communication data of the mentioned MCU by proxy;

29. The system as mentioned in Claim 27 features the mentioned multiple-picture supporting module, and can be used by industrial computers or PC computers.

30. The system as mentioned in Claim 22 features the mentioned multiple-picture server, and consists of the control module, media data module, decoder and D/A exchanging module;

The mentioned control module creates a control channel with the mentioned multiple-picture supporting module and becomes controlled by the multiple-picture supporting module;

The mentioned media data module receives the media data sent by the mentioned MP module and transmits the media data to the decoder.

The mentioned decoder receives video data, decodes and decompresses the compressed video data into image data, and then converts the digitalized image data into analog video signals by the D/A exchanging module and outputs the signals.

31. The system as mentioned in Claim 30 features the mentioned multiple-picture server that can use industrial computers or PC computers.

32. This method meeting any claim of Claim 22 to Claim 31, features the mentioned $n \geq 3$.

33. This method meeting any claim of Claim 22 to Claim 31, features the system and also includes: n terminals, Internet connection equipment, and multiple-picture display equipment, with $n \geq 3$;

The mentioned n terminals connect to the network through their own Internet connection equipment;

The mentioned MCU connects to the network through the Internet connection equipment;

The mentioned multiple-picture supporting module connects to the mentioned multiple-picture server through the Internet connection equipment;

The mentioned multiple-picture display equipment connects to the mentioned multiple-picture server;

The mentioned n terminals send image data each received from the n communication points to the network;

The multiple-picture supporting module is configured to extract image data of n points from the MCU through a network and transmit them to the multiple-picture server for processing;

The mentioned multiple-picture server converts the received image data into analog video signals and outputs the signals, so as to make it possible for any communication point to watch the images of other

communication points in real time.

34. This method meeting any claim of Claim 22 to Claim 31, features the system and also includes: n terminals, Internet connection equipment, n multiple-picture display equipment, and n multiple-picture servers, with $n \geq 3$;

The mentioned n terminals, n multiple-picture display equipment, and n multiple-picture servers connect to the network through their own Internet connection equipment;

The mentioned MCU connects to the network through the Internet connection equipment;

The mentioned multiple-picture supporting module connects to the mentioned multiple-picture server through the Internet connection equipment;

The mentioned multiple-picture display equipment connects to the mentioned multiple-picture server;

The mentioned n terminals send image data received from the n communication points to the network;

The multiple-picture supporting module is configured to extract image data of n points from the MCU through a network and transmit them to n multiple-picture servers for processing;

The mentioned n multiple-picture servers convert the received image data into analog video signals and output the mentioned video signals to multiple-picture display equipment connecting to the server for displaying, so as to make it possible for any communication point to watch the images of other communication points in real time.

35. The system as mentioned in Claim 33 featuring the mentioned network is an IP network; the mentioned multiple-picture display equipment is a multiple-picture TV wall; the mentioned multiple-picture supporting module can choose to connect to the mentioned multiple-picture server through an independent communication port.

36. The system as mentioned in Claim 34 featuring the mentioned network is an IP network; the mentioned multiple-picture display equipment is a multiple-picture TV wall; the mentioned multiple-picture supporting module can choose to connect to the mentioned multiple-picture server through an independent communication port.